WHAT IS CLAIMED IS:

1. A method of manufacturing a semiconductor device, the method of comprising: forming a wafer containing inlaid copper (Cu) or a Cu alloy; and
laser thermal annealing an exposed surface of the Cu or Cu alloy to remove oxide therefrom.

2. The method according to claim 1, comprising laser thermal annealing in ammonia (NH_3) or hydrogen (H_2).

3. The method according to claim 2, comprising laser thermal annealing in NH_3 at an NH_3 flow of about 200 to about 2,000 sccm.

4. The method according to claim 2, comprising laser thermal annealing in H_2 at an H_2 flow rate of about 200 to about 2,000 sccm.

5. The method according to claim 2, comprising laser thermal annealing at a temperature of about 370°C to about 420°C.

6. The method according to claim 5, comprising laser thermal annealing by impinging a pulsed laser light beam on the exposed surface at a radiant fluence of about 0.09 to about 0.11 joules/cm^2.

7. The method according to claim 5, comprising laser thermal annealing for about 10 to about 100 nanoseconds.

8. The method according to claim 1, comprising laser thermal annealing at a temperature of about 370°C to about 420°C.

9. The method according to claim 8, comprising laser thermal annealing for about 10 to about 100 nanoseconds.

10. The method according to claim 1, further comprising depositing a silicon nitride capping layer on the treated Cu surface.

11. The method according to claim 10, comprising depositing the silicon nitride capping layer by plasma enhanced chemical vapor deposition (PECVD).

12. The method according to claim 11, comprising depositing the silicon nitride capping layer at a thickness of about 450 Å to about 550 Å.

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13. The method according to claim 1, wherein the wafer contains a dual damascene structure comprising a Cu or Cu alloy line in contact with an underlying Cu or Cu alloy via formed in a dielectric layer.

14. The method according to claim 13, wherein the dielectric layer comprises a material having dielectric constant less than about 3.9.